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ROYAL BOTANIC GARDENS, KEW

XLVI.—WATER-COLOUR SKETCHES OF THE ROYAL BOTANIC GARDENS, KEW, BY THE LATE MRS. EMMA HUBBARD.

Mr. George Hubbard has very generously offered to lend the water-colour sketches made by his mother, the late Mrs. Emma Hubbard, to the Gardens, and his offer has been accepted by the Director, with the approval of the Minister of Agriculture and Fisheries.

The sketches, 37 in number, were made at the close of the XIXth Century by Mrs. Hubbard, who then resided in Kew, and are faithful representations of the Gardens at that time.

Mrs. Hubbard was a sister of Sir John Evans and Dr. Sebastian Evans. As the pictures show, she was a talented artist, and at the time of her death, in June, 1905, the obituary notice in the *Times* contained the following reference to this collection of drawings:—

“ Mrs. Hubbard was a not infrequent correspondent of *Nature* and other scientific periodicals, more particularly on the subject of birds and their ways, and several of her poems, either with or without her name, have appeared in Longman's Magazine and elsewhere. She was also an artist of considerable power, and her delineations of some of our rarer insects, drawn from the life, are remarkable for the knowledge they indicate of insect habits and attitudes, as well as for their scrupulous anatomical accuracy. Her principal pictorial work, however, consists of a series of water-colour sketches in Kew Gardens, for many years one of her favourite haunts. These drawings, remarkable not only for their artistic merit, but as an historic record of the garden woodlands at the beginning of the 20th Century, may, it is hoped, like those of Miss North, find a permanent and appropriate home in one of the Museums in the Gardens themselves.”

Since there was no suitable place for the display of the sketches in any of the Museums, Their Majesties The King and Queen have been graciously pleased to approve of their being exhibited in the long gallery on the first floor of Kew Palace, where they are now available for inspection.

A portrait of Mrs. Hubbard, with a short descriptive notice of the sketches, has also been hung on the wall of the gallery.

The pictures represent the following subjects :—

1. Cedar of Lebanon near Brentford Ferry Gate.
2. Cedar of Lebanon near Flag Staff.
3. Ruined Arch near North Gallery (Built 1759-60).
4. Beech Tree near Rhododendron Dell.
5. Autumn Scene in Kew.
6. Beeches. Old Deer Park in distance.
7. Seven Sisters Elms. Last of them blown down, March, 1916.
8. Old Oak Avenue near Cypress Collections.
9. Cedar of Lebanon, S.W. end of Rhododendron Dell.
10. Cedar of Lebanon on Mosque Hill near Tokyo Gate.
11. Pond and Campanile (Built 1847-48).
12. Beeches, N.E. end of Rhododendron Dell.
13. Campanile, Deodar Terminals.
14. Cart Road through wood near Temperate House.
15. Autumn Scene, S.W. end of Rhododendron Dell.
16. Beeches.
17. Bluebells, Queen's Cottage Grounds.
18. Bluebells, Queen's Cottage Grounds.
19. Woodland Scene, Kew Gardens.
20. Woodland Scene, Kew Gardens.
21. Woodland Scene, Kew Gardens.
22. Woodland Scene, East of Rhododendron Dell.
23. Temple of Bellona (Built 1760). Daffodils.
24. Entrance—East side of Bamboo Garden.
25. Lake with *Gunnera* in foreground.
26. Lake Scene.
27. Lake Scene—Deciduous Cyresses.
28. Lake Scene.
29. Lake Scene.
30. Tow path—Thames Side.
31. Old Kew Bridge (1896). Built 1783-89 ; demolished 1899.
32. Beeches, Kew Gardens.
33. Lake Scene.
34. Haystacks, Kew Gardens.
35. Ha-ha and Towing Path—Thames Side.
36. View of Thames from end of Sion Vista.
37. Woodland Scene, Kew Gardens.
38. Portrait of Mrs. Hubbard and descriptive notice.

These pictures, like the historical pictures of the Gardens and Village of Kew, which are exhibited, by the gracious permission of Their Majesties, in the rooms of the Palace leading out of the gallery (see *Kew Bulletin*, 1926, p. 369), are on loan to the Lord Chamberlain's Department.

XLVII.—*HISTORY OF PLANT NOMENCLATURE.

M. L. GREEN.

A University graduate with an average knowledge of systematic Botany starting to work in a great Herbarium and given a collection of living or dried plants to name finds himself as it were in a different world. In order to perform his work efficiently he has to become acquainted with the special bibliography of the subject—the different floras and monographs that have to be consulted. Armed with these he sets to work, and attempts to identify one of the specimens. He soon finds that he has to extend his knowledge of botanical terminology in order to make successful use of the keys and descriptions. When at last he succeeds in identifying a species he will probably have to decide which of two or more competing names assigned to it may be the correct one, and this demands a knowledge of Nomenclature, and in particular of the International Rules. Thus a special knowledge of plant nomenclature, terminology and special bibliography is essential for his work.

To the student of plant anatomy, or physiology, still more of cytology or ecology, the work of previous centuries possesses little more than an academic or historic interest, the knowledge of these subjects being comparatively modern, but the growth of systematic botany and nomenclature is traceable back to the distant past, and their origins are lost in the mists of antiquity. Hence a knowledge of the history of the subject is part of the equipment of the complete systematist. In a primitive stage of Society the average individual possesses a far greater hand-and-eye knowledge of plants, than the average civilized man. He has to know the different kinds of roots, grains, fruits and seeds that can be used as food, the plants that yield fibres for making clothing, mats and ropes, those that make good weapons, and the various medicinal and poisonous plants, the latter being of special importance in connection with the manufacture of arrow poisons for hunting and warfare. Each of these plants will bear a special name.

As an illustration of the extensive knowledge of plants possessed by relatively primitive peoples the Menomini Indians of Wisconsin may be cited. According to Huron H. Smith they use about one hundred and twenty different species as medicines and forty-five for food. They had separate names for two critical species of *Amelanchier* which, until quite recently, were not distinguished by botanists.

Primitive man grouped plants into three categories, trees, shrubs and herbs, and this primary systematic division of the vegetable kingdom was retained by botanists for 2,000 years. Even at the beginning of the eighteenth century John Ray, who first recognised the two great classes of Dicotyledons and Monocotyledons, made

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Herbs and Trees his two primary divisions (*Historia Plantarum* 1686-1704), each of which had Dicotyledons and Monocotyledons as subordinate groups.

The earliest names of plants were the common names. A good example is the name clover—the term was used for all plants with a cloven leaf, it was used in fact as a generic name, and the species were distinguished on account of a secondary character such as the colour of the flower, e.g. white clover, red clover, etc. These names are just as much specific as if they were latinised. Again the very old word “pulse” was used to represent all peas, beans, vetches and lentils, and it was restricted to plants with edible seeds belonging to the family now known as *Papilionaceae*. It is obvious that the early botanists did not consider the floral structure at all, in fact they knew nothing about the essential organs of the flower. To them the flower consisted chiefly of the “corolla,” with the result that classification was based only on vegetative characters. Thus all plants with leaves divided into three received the name of *Trifolium*—*Oxalis Acetosella* was called *Trifolium acetosum* both by Dodoens in 1583 and by Bauhin in 1623, also *Menyanthes trifoliata* was called by them *Trifolium palustre*. Very many similar examples could be given.

Scientific names of plants have great advantages over common names. They express relationship, they are international, and they are relatively unambiguous. Common names, on the other hand, frequently give a misleading clue to relationship, e.g. Yellow Loosestrife is *Lysimachia vulgaris* (*Primulaceae*) and Purple Loosestrife, *Lythrum Salicaria* (*Lythraceae*). Again several species of one genus may have entirely unconnected names, e.g. Yellow Pimpernel, Creeping Jenny, Yellow Loosestrife, all species of *Lysimachia*. Common names are also frequently very local—one plant being called by one name in one county and by another in the next. The same name also is given to several quite different plants.

An interesting feature of early botany compared with the science of the present day, is that at least as much attention was paid to the underground parts of the plant as to the leaves and the stem, and that the flower was comparatively neglected. Even in the figures of the early sixteenth-century botanists such as Brunfels and Fuchs, the underground parts of the plants form a conspicuous feature. This was due to the fact that the roots were used in medicine even more than the rest of the plants, and the study of Botany at first practically coincided with the study of medicinal plants.

Botanical grouping began with prehistoric man and has gone on ever since; even in the days of Theophrastus (B.C. 370) there was a certain plant nomenclature.

To study the evolution of modern nomenclature we cannot do better than take some outstanding botanists in chronological order and find out what contributions each one made to it. Nomenclature is so intimately connected with classification, description,

terminology and bibliography, that the gradual development of each of these branches must also be followed in outline.

Theophrastus has been termed the Father of Botany, because he was the author of the earliest extant treatise on the Science. He was born at Lesbos in B.C. 370, and died at the age of 85 in B.C. 285. He studied under Plato along with Aristotle, whose assistant and successor he afterwards became. He was primarily a philosopher and is said to have written 227 separate treatises on Religion, Politics, Ethics, Education, Rhetoric, Mathematics, Astronomy, Logic, Meteorology and Natural Sciences. His wide knowledge of Botany was derived partly from life-long study in his Botanic Garden, and partly from the accounts of exotic plants, given by scientifically-trained observers attached to the expeditions of Alexander the Great.

When reading his "Enquiry into Plants" it is difficult to realise that it was written over 2,000 years ago. His list of the members of the plant—root, stem, branch, twig, leaf, flower, fruit—might almost have come from the pages of a modern work on morphology. He drew a distinction between fibrous and tap roots, and doubted whether corms, bulbs, and rhizomes really ought to be called roots, in spite of the fact that they are underground. He described the aerial roots of the Banyan, and the adventitious roots of the Ivy. His classification of leaves is almost modern. He distinguished the whorled and scattered arrangements, the petioled and sessile condition, the simple and compound types, and the pinnate and palmate arrangements, arriving at the conclusion that the pinnate leaf of the ash, for example, was a single leaf because it fell off as a whole. Before his time the "flower" was merely a *brightly-coloured perianth*. Theophrastus drew attention to a second type of flower—the "capillary"—including those that have conspicuous stamens such as the grape, ivy, and the mulberry. Flowers like the rose, the violet and the lily he called "double" because inside the "leafy" flower, they had a "capillary" flower (Androeceum). Both Theophrastus and his predecessors regarded *green perianth* leaves as belonging to the foliage leaves, and it was only many centuries later that they were recognised as forming part of the flower. He distinguished polypetalous and gamopetalous corollas and superior and inferior fruits. His knowledge of fruits and seeds was extensive, and he was aware that the "date stone" was a seed, whereas the olive and the plum, he pointed out, had true stones. He implicitly recognised such groups as families, genera and species, but had no special terms for these categories. Nor did he propose any new systematic nomenclature, but used the common Greek names of the plants about which he wrote.

Very many of these common names have been perpetuated as the scientific names of genera, such as *Acanthus*, *Aconitum*, *Anemone*, *Antirrhinum*, *Aristolochia*, *Arum* and *Asparagus*, to mention merely a selection of the best known beginning with the letter A. Most of

these were names of single species representing genera which were then monotypic. Sometimes he used the name of a common species as a generic name followed by distinctive epithets for each of the other species. Thus *Drys* (proper) was *Quercus Robur*, the common oak; *Drys agria* *Quercus Aegilops* (Valonia Oak); *Drys platyphyllos* *Quercus lanuginosa* (Scrub oak) etc. This system of nomenclature persisted until the beginning of the eighteenth century, and is seen in the works of Rivinus (1652-1723), who for example, called the Garden Chervil, *Cerefolium*, and the other species *C. sylvestre*, etc.

Theophrastus recognised certain of our modern Families such as *Umbelliferae* ("Narthecodes"), *Gramineae* (with *Cyperaceae*, *Palmae*, etc.) ("Calamodes"), *Cichoriaceae* (Compositae with milky juice) ("Cichoriodes"). Altogether he mentions about 500 different species by name.

In reading Theophrastus care should be taken not to attach the modern conception of the term genus to his "genos." He used it in the sense of our word "kind," frequently for what are now called species, as in his account of the different kinds of oak. It can be seen, therefore, that Theophrastus had a very shrewd idea of the value of botanical classification. During the next three centuries he was recognised as the chief authority on Botany.

After Theophrastus the next outstanding figure in the history of Botany was the learned Greek physician, Dioscorides, who flourished some 350 years later, in the time of Nero, about 64 A.D. He was a native of Asia Minor, and travelled very widely in the Mediterranean Region. His fame rests on his great work describing about 600 plants, chiefly medicinal, with their properties and uses. This book was the standard treatise both of Botany and Medicine for over 1,500 years. The plants were grouped according to their properties, but it is evident that he recognised such families as the *Labiatae*, *Papilionaceae*, *Umbelliferae*, *Compositae* and *Solanaceae*.

With the revival of learning at the end of the Middle Ages the physicians of Europe attempted to identify the plants which were growing about them with those of Dioscorides. As many of the species and even some of the genera were different from those of the Mediterranean Region, their efforts were not very successful, and great differences of opinion arose as to the identity of many of the plants described by Dioscorides.

Owing to the absence of recognisable descriptions and figures it is frequently impossible to determine the plants mentioned in their works until 1530, when a new era in Systematic Botany was inaugurated by Brunfels. He published excellent wood engravings of over two hundred German plants along with extracts from Theophrastus, Pliny and others, describing the plants and their uses. Brunfels was born at Mainz in 1464. He was for many years a Carthusian monk, then a schoolmaster and Protestant theologian, and finally a physician. As a botanist he does not rank high, many of his identifications being erroneous, e.g. his identification of *Corydalis* with the

Aristolochia of the Ancients. The text of his work is practically a treasury of select quotations from Theophrastus, Dioscorides, Pliny and others, with hardly anything that is original.

The great service, however, which he rendered to Botanical Science was the provision of recognisable pictures of the plants with which he dealt, thus enabling other botanists to identify the species and so placing systematic botany on a relatively firm basis. His classification was based on medicinal properties, so that in some cases he associated widely different plants such as *Anemone Hepatica* and *Marchantia polymorpha* in the same genus. He recognised two species of *Verbena*, *V. mas* and *V. foemina*, the former being *Verbena officinalis*, the common Vervain, and the latter *Senecio vulgaris*, the groundsel. In a German edition published two years later he substituted *Sisymbrium officinale* for *Senecio vulgaris* as *Verbena foemina*.

Brunfels has been credited by E. L. Greene with having commenced the reform of botanical nomenclature by rejecting certain generic names composed of two words in favour of others consisting of a single word. Actually he seems to have thought one name as good as another, and to have used them more or less indifferently. In many cases he adopted one name in the text and a different one for the illustration. Thus for the Wood Sanicle he used both *Sanicula* (text) and *Diapensia* (figure), for Fumitory, *Capnos* and *Fumus terrae*, for the Germander Speedwell *Gamandraea* and *Chamaedrys*.

The next botanist who requires mention was Leonard Fuchs, a Bavarian physician who in 1542 published his *Historia Stirpium*, a fine volume containing over 500 excellent wood engravings of plants, for which he had employed two draughtsmen and the best engraver in Strasbourg. In order to save space he condensed the descriptions, and to make them intelligible supplied a glossary of botanical terms, including such words as internodium, scapus, apices (anthers), filamenta (filaments and styles). He proposed several new genera, including *Digitalis*. In reading Fuchs' *Historia* it is important to remember that he used some technical terms in a very different sense from their modern application. Thus by "genera" he meant what are now called species and varieties, and some of the genera bore binary names: thus *Vitis vinifera* (the vine), *Vitis alba* (white bryony) and *Vitis nigra* (Clematis) were not three species of *Vitis* but three different genera for him.

Contemporary with Fuchs is Hieronymus Tragus (1498-1554), the third great German botanist. He was the first who actually described plants. He had no money to employ draughtsmen and engravers, so was compelled to write descriptions of the less known plants in his book, so that his readers might be able to identify them. Illustrations were added, however, in the later editions. Tragus was the first to recognise the stamens and pistil as definite organs and thus inaugurated the scientific study of the flower. As far as nomenclature is concerned Tragus followed on the lines then in

vogue. He does not seem to have attached special importance to the Latin names which are sometimes mere translations of the German. Fuchs convinced that the genus *Plantago aquatica* is identical with *Alisma* of the Greeks uses the latter name in his text. Tragus however restored the original name *Plantago aquatica*, apparently because it corresponded with the German name "Wasser Wegerich" at the same time pointing out that the plant should not be placed among the other plantains. "Haec Germanis Wasser Wegerich, id est, *Plantago aquatica* (tametsi inter *Plantagines* non videatur connumeranda)".

An interesting example of Tragus substituting a binary generic name for a Fuchsian name is *Digitalis* for which he substituted *Campanula sylvestris*. His remarks show well the idea prevailing at the time that generic and other names could be altered if desired. "Let anyone name this plant what he will, we, in consideration of the form of the flower shall name it *Campanula sylvestris*, at least for the time being, and until a more appropriate name shall arise. There are those that call it *Digitalis*."

Up to this time names were either single, binary or sometimes composed of three words, this being due to the fact that the first two would constitute the generic name and the third the specific. There is as yet no trace of those phrase names that burdened botanists of the seventeenth and eighteenth century.

Whereas Brunfels and Fuchs figured plants and Tragus described them, Valerius Cordus (1515-44) introduced scientific terminology. Euricius Cordus, his father, had pointed out that very many plants grew in Germany that were unknown to the Greeks and Romans, and Valerius described many of them. He was the first man in history to establish many new genera, very few men between Dioscorides and Valerius Cordus made more than two or three. Cordus proposed so many that his book is a land-mark. A few of those mentioned by E. L. Greene are:—

Balsamella Cordus, now known as *Impatiens*, Coralloides (*Dentaria*), Helianthemum (*Helianthemum*), Moschatella (*Adoxa*), Oxy-coccus (*Oxycoccus*), Pneumonanthe (*Pneumonanthe*), Sagitta (*Sagittaria*).

Cordus introduced certain improvements into the classification and nomenclature of genera. He pointed out that the Ground Ivy (*Glechoma hederacea*), which was then commonly called *Hedera terrestris*, had nothing to do with the Ivy but had flowers like those of "*Chamaedrys*" [*Teucrium*] and "*Galeopsis*" [*Lamium*], thus implicitly recognising the family *Labiatae*. He proposed the new name *Chamaeclema* in place of *Hedera terrestris*.

It is interesting to note that Cordus had a certain regard for priority of names. Thus he found the name *Eupatorium* as employed by Dioscorides had been displaced by *Agrimonia*, and he proceeded to restore it.

Cordus though very young—he died at the age of twenty-nine—had a great knowledge of morphology. He agreed with Theophrastus that not everything below ground is necessarily a root, and he defined a rhizome as a “coliculus” or little stem. Inflorescences also received the first scientific treatment since the days of Theophrastus, for instance he appreciated that the fig was an inflorescence, and described it in detail. He mentioned the involucre—bracts subtending the flower. The calyx he distinguished from the corolla by its position, and united ovary, stamens and pistil under the term “flower”.

He was the first to draw attention to the peculiar habit of the Sundew, and also was the first to mention the tubercules on the roots of *Leguminosae*.

How ferns multiplied had always been a mystery to the Ancients. Cordus writes “*Trichomanes* grows abundantly on moist shaded rocks, although it produces no stem or flower or seed. It reproduces itself by means of the dust that is developed on the backs of the leaves, as do all kinds of ferns : and let this statement of the fact once and for all suffice.”

In the period of 93 years from the appearance of Brunfels, *Herbarium Vivae Icones* (1530) to that of C. Bauhin's *Pinax* (1623) many new species had been described by botanists in various parts of Europe, such as Tabernaemontanus and Camerarius in Germany, Dodoens, de l'Ecluse and de l'Obel in the Netherlands, d'Alechamps in France, Turner in England, Mattioli, Colonna and Prospero Alpino in Italy, and Monardes in Spain. Each of these used whatever names pleased him, so that botanical nomenclature became gradually more and more confused. This is well illustrated by the synonymy of the species now known as *Plantago media*. Various authors from Brunfels onwards had given it at least seven different names, including *P. major*, *latifolia*, *media*, *major incana*, *minor incana*.

Order was brought into systematic botany and nomenclature by Caspar Bauhin, who in 1623 published his *Pinax Theatri Botanici*. This was the first nomenclator, or list of all known plants with their synonyms. It was in a way the forerunner of the *Index Kewensis*. It was a bibliography and a concordance of previous work on Systematic Botany, and even at the present day it is very useful in identifying the species figured or described by the sixteenth century herbalists from Brunfels onwards, since Linné generally cites the names adopted by Bauhin.

Bauhin had projected a much larger work with descriptions and figures, but only a sample of this was published under the title *Prodromus Theatri Botanici* (1620). Bauhin gave the name “*Plantago latifolia incana*” to what is now called *P. media*. Like many of his names of species this was plurinomial, and partook more of the nature of a diagnostic phrase than of a name. As time went on and many more species of some genera became known, these diagnostic

phrases became very cumbersome, remaining in vogue up to the time of Linné.

Another outstanding botanist, who lived later in this century, was John Ray (1628-1705). His chief work was the *Historia Plantarum* (1686-1704), which included full descriptions of all the plants known at that time. The number of standard books included in his list of abbreviated citations was well over a hundred, which gives some indication of the progress that had been made since the appearance of C. Bauhin's *Pinax*. Some of his important contributions to taxonomy and morphology may be mentioned in passing. He was the first to distinguish Monocotyledons and Dicotyledons, and perceived that some seeds had endosperm and that others had none. Undoubtedly Ray's system was the most natural one up to the time of Linné.

Another great systematist of the late seventeenth century was Tournefort (1656-1708). He has been regarded as the founder of genera in the plant kingdom. But it has already been shown that he cannot properly be given that distinction. The first systematic enumeration of genera is that in Caspar Bauhin's *Pinax*. There is a great difference between the work of Bauhin and that of Tournefort. Bauhin only gave names to genera, without descriptions, but distinguished the species by diagnostic phrases. Tournefort on the other hand provided his genera with names, descriptions and figures. Tournefort's chief work "*Institutiones Rei Herbariae*" (1700), has great method in it, every class being divided into sections, these into genera and these again into species. Most of Tournefort's generic names are uninominal but some are binominal such as *Ruta Muraria*, *Caryophyllus aromaticus* and *Auricula Ursi*. The two former might be mistaken for species of the very different genera *Ruta* and *Caryophyllus*, which he also recognises. Tournefort's theories do not appear as advanced as Ray's and his system was certainly more artificial.

As already indicated, Nomenclature at this time had become extremely cumbersome, as it was quite usual for species to be known by long sentences. Linné in 1753 replaced each of these diagnostic phrases by a binary name and this reform was found to be so convenient that it met with almost immediate acceptance. Carl Linné (1707-1778), a Swede, was born at Rashult where his father was a pastor. It is usual to say that a new era in the history of botany begins with him, but it is far better, following Sachs, to regard him as the last link of a chain of botanists such as Ray, Tournefort, etc., since his views are in the main the same as theirs. Linné systematised what had gone before him, and this placed him in a unique position. He recognised the functions of the stamens, and pistils, and introduced a new scheme of classification, known as the "Sexual System of Linnaeus," based on their number, relative position, etc. This was at least a convenient classification albeit an artificial one. He introduced various terms still in use such as monoecious and dioecious.

We are indebted to Linné for three great services.

1. His introduction of a consistent binary nomenclature for species, each species bearing only two names, the first being the generic and the second the specific.

2. The introduction of his Sexual System which for the first time supplied a thoroughly workable and convenient scheme for the arrangement of genera.

3. The publication of the "Species Plantarum," ed. 1 (1753), in which he repeated Caspar Bauhin's feat of one hundred and thirty years earlier of restoring order to Systematic Botany.

Linné thus cleared the ground for systematic botany, and it is therefore essential that our present system of Nomenclature should date from the year 1753, the year in which he published the first edition of the "Species Plantarum." Inspection of this work shows to what a large extent (as regards European plants) it was based on Bauhin's Pinax. Under the accepted binominal Linné gave only the more important synonyms. Thus when he referred to Bauhin's Pinax he considered it unnecessary to quote also the older works of Brunfels, Fuchs, Mattioli and others which Bauhin had already cited.

Linné was well aware of the artificial nature of his Sexual System, and had even published a fragmentary sketch of a Natural System, but the introduction of our present "Natural System" dates from the year 1789, when A. L. de Jussieu published his celebrated "Genera Plantarum" in which many of our modern "Natural Families" are defined, though sometimes under different names.

After the time of Linné Systematic Botany made great progress. Nomenclature and Classification were far more stabilised, and the way was prepared for the numerous taxonomic systems that were to follow. The names of natural plant families recognised by Linné were mainly descriptive such as *Coniferae*, *Umbellatae* and *Asperifoliae*. Jussieu, on the other hand, employed many plurals of generic names such as *Junci* and *Polemonia*, thus emphasising the fact that his families were aggregates around a typical genus. As this plural form was misleading, De Candolle introduced a variety of distinctive endings for family names including *-aceae*, *-ineae*, *-arieae*, *-ideae*. Lindley adopted the uniform termination *-aceae* for family names, and this is now accepted with the exception of eight well known names conserved under the International Rules e.g. *Labiatae*, *Compositae*.

In the year 1821 Steudel's "Nomenclator Botanicus" appeared. It consisted of a list of the names of all flowering plants then known with their synonyms. A second edition appeared in the year 1840. It was an extremely useful work of reference and, as will be seen later, was of great service in the preparation of the *Index Kewensis*. Another important work which was commenced in 1818 and continued up to 1873 was De Candolle's *Prodromus*; an enumeration with descriptions of all the known Dicotyledons based on a definitely natural system.

Various other systems were put forward during the nineteenth century, amongst them that of Bentham and Hooker's *Genera Plantarum*, a system that is still standard and still very largely followed. The first volume appeared in 1862 and the last in 1883.

From the year 1840 to 1880 or thereabouts very many new plants were described and there was no complete index of them, so it was quite possible for the same plant to be named and described more than once. To give a single example: Linden & Planchon in 1863 printed descriptions of eleven species from Colombia and Venezuela, not realising that in 1854 and 1858 these very same species had been described under other names in a Russian botanical periodical by Turczaninow.

Thus it came about that in 1881 Sir William Thiselton-Dyer after a Committee Meeting at the Linnean Society first broached the subject of the *Index Kewensis*. He stated that Charles Darwin had received so much help from Steudel's *Nomenclator*, then forty years old, that he was prepared to devote a sum of money annually for several years if a suitable person could be found to compile a list of the vast number of names that had been published since its issue. The task was entrusted to Dr. B. Daydon Jackson, who had established his reputation as a bibliographer by the publication of his "Guide to the Literature of Botany". At his suggestion the scope of the work was enlarged to include all the names of genera and species of flowering plants published from the time of Linné down to the end of the year 1885, with references to their places of publication. To quote his own words "I emphasized the desirability of giving references to all the names pointing out that a work on Steudel's plan, based solely on synonymy, would in no long time become out of date, whilst an enumeration of genera and species, with their place of publication during one hundred and fifty years, would be of permanent value." Dr. Jackson and his assistants carried out the work in the Kew Herbarium, where the continuation of the *Index* is still in progress. Quinquennial supplements are published by the Clarendon Press, and the latest, Supplement VI, appeared in 1926. One of the chief sources from which the original *Index* was compiled was the interleaved copy of Steudel's *Nomenclator* which had been kept more or less up to date at Kew. Other sources of help were Richter's *Codex Linnaeanus* for the Linnean names, De Candolle's *Prodromus* and *Monographiae*, Kunth's *Enumeratio*, Walper's *Repertorium* and *Annales*, and various floras of large areas, such as Bentham's *Flora Australiensis*, Hooker's *Flora of British India*, Martius' *Flora Brasiliensis* and Boissier's *Flora Orientalis*. By experiment Dr. Jackson found that up to 1850 practically all names were accounted for in the main works consulted. From that year onwards up to the end of 1885 the new names were extracted from the original works themselves. The indication of the geographical distribution of the species was revised by Sir Joseph Hooker.

The *Index* was a monumental work and took about ten years to compile and revise. The publication was undertaken by the Clarendon Press. It appeared in four fascicles making two thick volumes (1893-95). The first supplement covering the period 1886-1895 was prepared by Messrs. Th. Durand and B. Daydon Jackson and published in Brussels. Succeeding supplements, one every five years, are prepared at Kew. It is estimated that about four hundred periodicals are searched for new names for each supplement in addition to all the independent works published during the particular five years. There are usually over thirty thousand new names in each supplement.

The scope of the original *Index* is rather different from that of the present supplements. In the main work, generic reductions were made in accordance with Bentham & Hooker's *Genera Plantarum*, and reductions of species on the authority of various standard floras and monographs. Such reductions, however, only represent the views of the particular author or authors. It should also be borne in mind that the reduction of one species to another in the *Index Kewensis* did not necessarily imply that the two were regarded as being exactly the same. As varieties were not indexed any species which was treated as a variety of another was reduced to it in the *Index* in precisely the same way as if the two had been strictly identical. In the first, second and third supplements (1886-1905) generic reductions were made in accordance with the *Genera Plantarum*. When the fourth supplement was in preparation, however, it was realised that the chief value of the Supplements was as an *Index* not as a *Nomenclator*, and from the fourth supplement onwards all new names were printed in the same type, no reductions being made. The use of the sign = might have led to misconception, so it was replaced by a colon.

When the original *Index* was compiled, the year 1735 (or 1737) was generally accepted as the starting point for the nomenclature of genera, and 1753 for that of species. But in 1905 at the International conference held at Vienna, the year 1753 was fixed as the starting point for both genera and species.

In looking through the names in the *Index Kewensis* and considering the reductions made therein, it was very obvious that the same plant was frequently known by several names, and it was not an easy matter to find out the correct name, since different botanists held opposing views. To meet these needs the International Rules of Botanical Nomenclature were evolved with the result that there is now far greater uniformity.

These rules were drawn up at the International Botanical Congress in 1905 at Vienna. A few additions and modifications were introduced in 1910 at the Brussels Congress. This is the last formal International Congress that has taken place. One was due in London in 1915 but was postponed owing to the War. Since then two Conferences have been held, the one in London in 1924—an

Imperial Conference—and an International Congress of Plant Sciences at Ithaca in 1926, neither of which assumed legislative functions. The next International Botanical Congress is to be held at Cambridge in 1930 and, being the true successor to the Brussels Congress of 1910, it will have power to enact legislation.

The Rules at present consist of sixty Articles and forty-six Recommendations. Perhaps the most important Rules are those which deal with publication, priority and stability of names.

No name is recognised as valid unless it is published with a description or a reference to a former description under another name.

Of two competing names for the same group the one which was first published is the one to be accepted.

When a species is transferred from one genus to another the original specific name is retained unless it duplicates a valid name.

In order to avoid disturbing changes in the nomenclature of well known genera by the strict application of the Rules, a list was drawn up of well known generic names which are to be retained as exceptions, e.g. *Capsella*, *Luzula* and *Taraxacum*.

Since the Brussels Congress it has been discovered that several important generic names, such as, *Combretum* and *Nuphar* will have to be superseded on account of earlier names. It is hoped, however, that these and others will be added to the list of conserved names at the coming International Congress in 1930.

The following is a list of works dealing with the subject of this paper.

THEOPHRASTUS,—Enquiry into Plants, ed. Hort (London and New York, 1916).

DIOSCORIDES,—Materia Medica, ed. Sprengel (Leipsig 1829-30).

BRUNFELS, O.—Herbarium Vivae Icones (1530).

FUCHS, L.—Historia Stirpium (1542).

CORDUS, VALERIUS,—Historia Stirpium (1561).

BAUHIN, C.—Pinax Theatri Botanici (1623).

RAY, J.—Historia Plantarum (1686-1704).

TOURNEFORT, J. P. DE —“ Institutiones Rei Herbariae ” (1700).

LINNÉ, C. VON —Species Plantarum, ed. 1 (1753); Genera Plantarum, ed. 5 (1754).

JUSSIEU, A. L. DE —Genera Plantarum (1789).

STEUDEL, E. G.—Nomenclator Botanicus (1821; ed. 2, 1840-41).

CANDOLLE, A. P. DE —Prodromus Systematis Naturalis (1824-73).

BENTHAM, G. & HOOKER, J. D.—Genera Plantarum (1862-83).

JACKSON, B. D.—Index Kewensis (1893-95).

INDEX KEWENSIS, Supplement 1 (prepared at Brussels 1901-1906).

” ” Supplements 2—6 (prepared at Kew under the auspices of the Director, 1904-1926).

BRIQUET, J.—International Rules of Botanical Nomenclature, ed. 2 (Jena, 1912).

SPRENGEL, K.—Geschichte der Botanik (1817-18).

MEYER, E. H. F.—Geschichte der Botanik (1854-57).

- SACHS, F. G. J. VON.—History of Botany (1530-1860), English Edition (1890).
GREENE, E. L.—Landmarks of Botanical History (1909).
ARBER, A.—Herbals, their Origin and Evolution (1912).
HARVEY-GIBSON, R. J.—Outlines of the History of Botany (1919).
SPRAGUE, T. A.—The Nomenclature of Plant Families (Journ. Bot. 1922, pp. 69-73).
SMITH, H. H.—Ethnobotany of the Menomini Indians (Bull. Publ. Mus. Milwaukee, 1923).
JACKSON, B. D.—History of the Compilation of the Index Kewensis (Journ. Roy. Hort. Soc., Lond. xlix. pp. 224-229 : 1924).
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XLVIII.—AFRICAN ORCHIDS, I. V. S. SUMMERHAYES.

Eulophia chilangensis sp. nov.; affinis *E. massokoensi* Schltr., a qua sepalis petalisque latioribus obtusioribusque et labelli lobo intermedio nudo differt.

Herba terrestris, erecta, 35-40 cm. alta. *Rhizoma* nondum notum. *Folia* (sub anthesi nondum omnino evoluta) linearia, acuta, rigida, 4-6 cm. longa. *Scapus* erectus, substrictus, vaginulis perpaucis lanceolatis praeditus, teres, glaber. *Racemus* laxe 13-15-florus, usque ad 23 cm. longus; bracteae lineari-lanceolatae, acuminatae, ovario pedicelloque vix duplo breviores. *Sepala* late linearia, obtusa vel subacuta, lateralia leviter falcata, 9-9.5 mm. longa, 1.5-2 mm. lata. *Petala* oblique sublonga, acuta vel apiculata, 7-8 mm. longa, 2-2.5 mm. lata. *Labellum* obpanduratum, 8 mm. longum, medio 4 mm. latum, nervis primariis 3 incrassatis e basi usque infra apicem decurrentibus, nervis secundariis basi incrassatis; calcar gracile, flexuosum, apice subdilatatum. *Columna* subteres, glabra, 3 mm. longa.

NORTHERN RHODESIA. Chilanga, 20 miles N. of Kafue River, on loam, 900 m., Oct. 1909, *F. A. Rogers* 8522.

Eulophia anisotepala sp. nov.; species *E. brevipetalae* Rolfe proxima, petalis oblongis, labelli disco 3-nervato recedit.

Herba perennis, terrestris. *Folia* sub anthesi vix evoluta, anguste linearia, ad 8 cm. longa, acutissima. *Scapus* erectus, subflexuosus, gracilis, glaber, 60 cm. altus, vaginulis paucis lanceolatis acutis instructus. *Racemus* secundus, subaxe 16-florus, erectus, 24 cm. longus; bracteae lanceolatae, acuminatae, ovario pedicelloque multo breviores. *Flores* patentes, glabri. *Sepala* subspathulato-linearia, lateralia oblique acuta, 8-10 mm. longa. *Petala* oblique oblonga, obtusa, 5-5.5 mm. longa. *Labellum* ambitu oblongum, supra medium trilobatum, 5.5 mm. longum, medio 3 mm. latum, nervis primariis 3 incrassatis in lobo intermedio dense breviter barbatis; lobus intermedius obovatus, 2 mm. longus, vix 2 mm. latus; lobi laterales perbreves, rotundati vel obtusissimi;

calcar basi gracile, apice recurvum ampliatum, 3-4 mm. longum. *Columna* 3 mm. longa, glabra, pede brevi.

NORTHERN RHODESIA. Mumbwa, Mrs. Macaulay 968.

Eulophia Macaulayi sp. nov.; affinis *E. encyclioidi* Schltr., sed sepalis distincte spathulato-linearibus, labelli lobo intermedio breviori, carinis tuberculato-appendiculatis satis distinguenda.

Herba perennis, terrestris, gracilis, 27-33 cm. alta. *Folia* 3, fasciculata, anguste linearia, acuta, sub anthesi ad 10 cm. longa. *Scapus* erectus, vaginulis paucis lanceolatis praeditus, subflexuosus, teres, glaber. *Racemus* laxe 7-9-florus, 12-15 cm. longus; bracteae lineari-lanceolatae, acuminatae, ovario multo breviores. *Flores* erecto-patentes, post anthesin nutantes, pedicellis cum ovario 10-11 mm. longis. *Sepala* spathulato-linearia, acuta, leviter falcata, 12-15 mm. longa, superne 1.5-2 mm. lata. *Petala* oblonga vel lanceolato-oblonga, obtusa, 8-11 mm. longa, 2-3 mm. lata. *Labellum* supra medium trilobatum, 11-12 mm. longum, explanatum inter apices loborum 6 mm. latum, lineis 3 incrassatis parallelis e basi labelli usque in basin lobi intermedii decurrentibus; lobus intermedius ellipticus vel obovato-ellipticus, margine crenulatus, 4-6 mm. longus, 3-4.5 mm. latus, carinis appendicibus tuberculatis congestis obtectis; lobi laterales oblique triangulares, subacuti, intermedio multo breviores; calcar cylindricum vel apicem versus paulum inflatum, leviter curvatum, 4-5 mm. longum. *Columna* 4-5 mm. longa, pede brevi.

NORTHERN RHODESIA. Mumbwa, Mrs. Macaulay 964 (type), 1033.

Eulophia mumbwaensis sp. nov.; affinis *E. sabulosae* Schltr., a qua labello angustiore, lobis lateralibus subacutis differt.

Herba perennis, rhizomate et foliis nondum notis. *Scapus* erectus, strictus, 34 cm. longus, vaginula singula arcte adpressa instructus, teres, glaber. *Racemus* laxe 6-florus, 12 cm. longus; bracteae lanceolatae, acuminatae, 5-8 mm. longae. *Flores* patentes, glabri, pedicellis cum ovario 7-14 mm. longis. *Sepalum* dorsale lineare, basi sensim attenuatum, apice acutum, 16 mm. longum; sepalia lateralalia linearia, acuta, 15-18 mm. longa, 1.5-2.5 mm. lata. *Petala* oblonga vel lanceolato-oblonga, obtusa, 8-10 mm. longa, 2-2.5 mm. lata. *Labellum* e medio trilobatum, totum 10-14 mm. longum; lobus intermedius anguste obovatus, mucronatus, 6-8 mm. longus, 3-4 mm. latus; lobi laterales subacuti, intermedio multo breviores; carinae 3, inferne nudaе, in disco medio dense breviterque barbatae; calcar cylindricum, subrectum, 3 mm. longum. *Columna* glabra, leviter falcata, 5 mm. longa, pede distincto.

NORTHERN RHODESIA. Mumbwa, Mrs. Macaulay 859.

Eulophia acutilabra sp. nov.; affinis *E. venulosae* Rchb. f., a qua floribus minoribus, labelli lobis lateralibus magis evolutis, calcari longiore et angustiore differt.

Herba terrestris. *Folia* sub anthesi vix evoluta, circiter 3 cm. longa, anguste linearia. *Scapus* erectus, strictus, gracilis, circiter

20 cm. altus, vaginulis paucis praeditus. *Racemus* laxe 4-florus, 6-7 cm. longus; bracteae lineari-lanceolatae, acuminatae, ovario multo breviores. *Flores* patentes, glabri, pedicellis cum ovario 8-10 mm. longis. *Sepala* anguste linearia, acuminata, 9-11 mm. longa. *Petala* oblongo-linearia, acuminata, 8-9 mm. longa, 2-2.5 mm. lata, sepalis duplo latiora. *Labellum* infra medium trilobatum, 9-10 mm. longum, inter apices loborum lateralium 5 mm. latum; lobi laterales breves, obtusi vel rotundati; lobus intermedius obovatus, valde cuspidatus, 5-6 mm. longus, margine inferne minute crenulatus; labellum lineis 3 elevatis antice tuberculato-cristatis e basi usque infra apicem decurrentibus; calcar cylindricum, gracile, subfalcitum recurvatum, 3 mm. longum. *Columna* pro rata brevis, glabra, 3 mm. longa, pede perbrevis.

BELGIAN CONGO. Katanga, Comite Specials farm, 1350-1440 m., Nov. 27th, 1923, C. W. Von Hirschberg 138.

"Flowers white shaded with pinkish mauve, sepals green with reddish markings. Rare, only two specimens found."

Eulophidium zanzibaricum sp. nov.; ab *E. Ledienii* De Wild. panicula ramosa, labello majore, calcar apice vix dilatato, ab *E. warneckeano* Kraenzl. inflorescentia multiflora, lamellis basi labelli longitudinalibus nec oblique transversis, lobo intermedio labelli margine integro, ab omnibus aliis speciebus foliis satis longioribus, floribus majoribus distinguenda.

Rhizoma repens, radicibus carnosiss. *Pseudobulbi* breves, cylindrici, 1-1.5 cm. longi, unifoliati, basi cataphyllis paucis lanceolatis acuminatis usque ad 4 cm. longis cincti. *Folia* petiolata, lanceolata vel lineari-lanceolata, apice acuta, basi complicata, cuneata, 7-45 cm. longa, 2-3.5 cm. lata, subcoriacea, utrinque glabra. *Scapus* erectus, folia aequans vel superans, 25-46 cm. longus, inferne vaginis 1-3 remotis adpressis lanceolatis acuminatis 2-3.5 cm. longis instructus. *Panicula* basi pauciramosa, saepius multiflora, 8-35 cm. longa; rhachis teres, glabra. *Bracteae* lanceolatae vel lineari-subulatae, 1-12 mm. longae; cataphylla ramos subtendentia bracteis majora, 1-1-2.5 cm. longa. *Pedicelli* graciles, 1-1.5 cm. longi. *Sepalum* dorsale oblongo-lanceolatum, apiculatum, 8-10.5 mm. longum, 3-4 mm. latum; sepala lateralia oblique vel falcitum oblanceolata, apiculata, 8-10 mm. longa, 3-4.5 mm. lata. *Petala* oblongo-elliptica, acuta vel apiculata, 7.5-9 mm. longa, 3-4.5 mm. lata. *Labellum* ambitu quadratum, trilobum; lobi laterales rotundati, 2-3 mm. longi; lobus intermedius profunde bifidus, 6.5-8 mm. latus, lobulis plus minusve divergentibus oblique obovatis vel subquadratis 4 mm. longis; totum labellum 8-10.5 mm. longum, 8-11.5 mm. latum, basi lamellis 2 brevibus longitudinalibus compressis instructum; calcar cylindricum, rectum, obtusum, 3-4 mm. longum. *Columna* 2.5 mm. longa, leviter incurva, in pedem 1-2 mm. longum producta. *Ovarium* gracillimum.

ZANZIBAR. 1908, J. T. Last.

Polystachya Dalzielii sp. nov. ; affinis *P. Pobeguinii* Rolfe, sed labello non geniculato brevissime unguiculato, floribus minoribus differt.

Planta epiphytica, radicibus copiosis carnosis. *Caules* breves, basi incrassati ita ut pseudobulbosi videantur, paucifoliati. *Folia* e basi vaginanti lineari-lanceolata vel lineari-oblonga, obtusa, 11–12 cm. longa, 12–15 mm. lata. *Scapi* 5–8 cm. alti, racemosi, 4–8-flori, apice subnutantes, basi vaginis 5–6 scariosis acutis vestiti, sparse pubescentes ; bracteae minutae, latissime ovatae, apiculatae, circiter 1 mm. longae ; pedicelli cum ovario 5–7 mm. longi. *Flores* pallide roseo-purpurei. *Sepalum* dorsale oblongum, 3–5 mm. longum, apice inaequaliter trilobum, lobis lateralibus fere obsoletis, lobo intermedio late ovato dorso cornu minuto praedito. *Sepala* lateralialia latissime triangulo-ovata, apice emarginata, dorso cuspidata, 6–7 mm. longa. *Petala* cuneato-obovata, apice fere bilobulata, 4 mm. longa. *Labellum* brevissime unguiculatum, ungue callo applanato dentiformi instructo, ambitu elliptico-oblongum, antice margine undulatum, 5 mm. longum, disci pulvinaribus duobus oblongis. *Columna* brevis, lata, 1 mm. longa.

FRENCH GUINEA. Dalaba, Futa Jallon, fl. March, *J. M. Dalziel* (A. V. Armour Expedition 1926–7) 8433.

Aerangis collum-cygni sp. nov. ; inter omnibus speciebus calcari valde incurvo satis distinguenda.

Epiphytica ; caules usque ad 3 cm. longi, radicibus teretibus 2.5–3 mm. diametro. *Folia* disticha, oblanceolata, recta vel leviter falcata, basi conduplicata, apice inaequaliter acutiuscule biloba, 7–11 cm. longa, supra medium 1.9–2.4 cm. lata, carnosa, utrinque praesertim versus basin nigro-punctata, costa supra leviter impressa. *Racemus* unus quem solum vide adscendens, 12 cm. longus ; rhachis teres, 1.8 mm. diametro, nigro-punctata. *Flores* 5, 1.7–2.0 cm. distantes, albi, 2.5–3 cm. diametro ; pedicelli graciles, 2.3–2.6 cm. longi. *Sepala* oblonga-lanceolata, acuta, 1.2–1.4 cm. longa, 4–5 mm. lata, valde reflexa. *Petala* sepalis similia sed paulo minora, 1.1 cm. longa, 3 mm. lata, reflexa. *Labellum* lanceolatum, convexum, acutum, 1–1.2 cm. longum, de calcari reflexum ; calcar pro generi crassum, circinate incurvum, 3–4.5 cm. longum, apice angustatum. *Columna* 6–7 mm. longa, 2.2–2.3 mm. diametro. *Stipes* polliniorum singulus, gracillimus.

UGANDA. Coll. *C. H. Lankester* and flowered at the Royal Botanic Gardens, Kew, in September, 1926.

Deroemera pentadactyla sp. nov. ; affinis *D. unifoliae* Rchb. f., sed petalis quinquelobis, calcari ovario aequali facile distinguenda.

Herba terrestris. *Folia* desunt. *Scapus* erectus, usque ad 30 cm. altus, sub anthesi aphyllus, teres, basi retrorse pilosus, superne glaber, cataphyllis parvis lanceolatis acuminatis distantibus 4–5.5 mm. longis praeditus. *Racemus* secundus, densus, 2.5–7.5 cm. longus, 12–30-florus. *Bracteae* ovato-lanceolatae, acuminatae,

3-4 mm. longae. *Flores* albi. *Sepala* ovata, acuta, concava, dorsale 4 mm. longum, lateralia 2.5-3 mm. longa. *Petala* cuneata, superne valde quinqueloba vel rarius quadriloba, plus minusve obliqua, 5-6 mm. longa, 2.5-3 mm. lata. *Labellum* petalis simile sed latius, quinquelobum, 4 mm. longum, 3.5-4 mm. latum; calcar plus minusve curvatum, ovarium aequans vel paulo longius, 7-8 mm. longum. *Columna* 2.5 mm. longa.

KENYA COLONY. Eastern Aberdares, grasslands, 2820 m., *H. M. Gardner* 1340 (type); Mau Plateau, 2850 m., *E. Battiscombe* 915.

This genus, for a reason not given, has by recent authors, beginning with Rendle and Schlechter in 1895, been spelt *Deroemeria*. It was named originally by Reichenbach after J. J. Roemer and was spelt as given above.

Disa (§ *Calostachys*) **aequiloba** sp. nov.; affinis *D. Welwitschii* Rchb. f., a qua spicis laxioribus, floribus minoribus, petali segmentis aequalibus differt.

Herba perennis, erecta, 25-38 cm. alta. *Folia* basilaria nondum nota. *Caulis* strictus, vaginis 7-9 arcte et alte amplectentibus acuminatis maculatis obtectus. *Racemus* subdensus, multiflorus, 6-9 cm. longus; bracteae lanceolatae, acuminatae, flores superantes vel vix aequantes. *Flores* erecto-patentes, glabri. *Sepalum* dorsale orbiculari-obovatum, sessile, valde concavum, circiter 4.5 mm. longum, circiter 3 mm. latum, calcar pendulo cylindrico obtusiusculo 4.5 mm. longo; sepala lateralia patentia, oblonga vel oblongo-elliptica, obtusa, 5 mm. longa. *Petala* subflabellata vel late cuneata, biloba, 4.5 mm. longa, lobis aequilongis; lobus anterior quam posterior latior, 2 mm. latus, sinum versus dentatus; lobus posterior apice margine anteriore apiculatus, 1-1.5 mm. latus. *Labellum* lineare, acutum, 5 mm. longum. *Anthera* erecta, 2.7 mm. longa, rostello humili. *Ovarium* cylindricum, glabrum, 1.1 cm. longum.

BELGIAN CONGO. Katanga, in moist places, January, *C. W. Von Hirschberg* 177.

"Flower magenta spotted with darker shades, stem red, bracts and leaves spotted."

XLIX.—THE IDENTITY OF TALAUMA VILLARIANA. J. E. DANDY.

The name *Talauma Villariana* first appeared in 1884 in a paper by Rolfe on the flora of the Philippine Islands¹. Its publication consisted of a brief diagnosis in English pointing out the chief points of difference from *T. mutabilis* Bl., accompanied by a reference to *T. mutabilis* F.-Vill. (non Bl.) as a synonym. The latter plant, enumerated by F.-Villar² and figured by Naves³ as *T. mutabilis* Bl., represents a species which is closely allied to, but distinct from, the

¹ Journ. Linn. Soc., Bot. 21:307 (1884). ² Blanco Fl. Filip., Ed. 3, Nov. App. 3 (1880). ³ Blanco l.c.: t. 148.

true *T. mutabilis* (*T. Candollei* Bl.), and which is now known from almost all the Philippine Islands and also from Northern Borneo. Accepting Rolfe's synonymy as correct, Merrill ¹ regarded this species as *T. Villariana*, under which name it is now known. Rolfe, however, was incorrect in giving *T. mutabilis* F.-Vill. as a synonym of *T. Villariana*, as the following evidence shows.

Although Rolfe did not accompany the publication of his *T. Villariana* by the citation of any specimens, the plant upon which it was actually based was a specimen (*Vidal* 5) in the Kew Herbarium, which he himself wrote up as the type of *T. Villariana*. This specimen, which corresponds exactly with his diagnosis, is now found to consist of flowering material of *T. angatensis* (Blanco) F.-Vill.; the flower is typical of that species and is quite different in its very numerous pubescent carpels from that of *T. mutabilis* F.-Vill.; the leaves, though smaller than the average for *T. angatensis*, which is very variable in leaf-size, also agree with the latter species and not with *T. mutabilis* F.-Vill. It was probably the small size of its leaves that caused Rolfe to identify the Kew specimen with *T. mutabilis* F.-Vill. instead of with *T. angatensis*. It is clear, however, that *T. Villariana* was founded upon a specimen of *T. angatensis* ², and the name *T. Villariana* must therefore be regarded as a synonym of *T. angatensis*. It is significant that the type-specimen of *T. Villariana* was collected by Vidal at Angat, in Bulacan Province, Luzon, the type-locality for *T. angatensis*.

The species usually known as *T. Villariana*, i.e. *T. mutabilis* F.-Vill., is a very variable plant and embraces *T. gitingensis* Elmer ³ and *T. borneensis* Merr. *T. borneensis* has larger leaves than most specimens of the so-called *T. Villariana*, but is indistinguishable from the bigger-leaved examples of the latter. *T. gitingensis* dates from 1912, and *T. borneensis* was described in 1922, so that the former should be regarded as the correct name for the species, whose synonymy is as follows :—

***Talauma gitingensis* Elmer** Leaflet. Philipp. Bot. 4 : 1479 (1912).

Talauma mutabilis F.-Vill. in Blanco Fl. Filip., Ed. 3, Nov. App. 3 (1880).—Naves in Blanco l.c. : t. 148 (1877-83).—non Bl.

Talauma Villariana Merr. in Bur. Gov. Lab. (Philipp.) Publ. 35 : 7 (1906); in Philipp. Journ. Sci. 1, Suppl. 52 (1906); l.c., Bot. 5 : 348 (1910); Enum. Philipp. Pl. 2 : 152 (1923).—non Rolfe.

Talauma borneensis Merr. in Journ. Straits Br. R. As. Soc. 85 : 173 (1922).

¹ Bur. Gov. Lab. (Philipp.) Publ. 35 : 7 (1906). ² Merrill (l.c. : 8) stated that *T. Villariana* was based upon Naves' plate and Vidal's numbers 942 and 1099, and did not mention Vidal's n. 5. All three specimens, however, represent *T. angatensis*. ³ Merrill reduced *T. gitingensis* to *T. Villariana* in his Enum. Philipp. Pl. 2 : 152 (1923).

L.—MISCELLANEOUS NOTES.

The following appointments have been made by the Secretary of State for the Colonies :—Mr. J. F. V. PHILLIPS, B.Sc., Botanist, Game Preservation, Tanganyika Territory ; Mr. T. D. RUTTER, B.Sc., Agricultural Officer, Zanzibar ; Mr. R. G. BENTALL, B.A. (Agric.), Assistant Agricultural Officer, Kenya ; Mr. D. H. BROWN, Superintendent, Agricultural Department, Nigeria.

MR. CHARLES MORRIS WOODFORD, C.M.G., whose death took place at Steyning, Sussex, on October the 4th, was associated with the Southern Pacific for 44 years. He went out in 1871 as collector for the Rothschild Museum at Tring and afterwards spent ten years in exploring Melanesia. He first corresponded with Kew in 1890, when he stated that he had sent some orchid plants from the Solomon Islands to England. In the same year he sent a fan palm (*Licuala* sp.) to Kew. From 1883 he held various Government appointments in Fiji, Samoa, etc., and in 1897 was appointed by Sir John B. Thurston (another Kew correspondent) as first Resident Commissioner in the British Solomon Islands Protectorate, where he introduced the cultivation of coffee, and held this post until 1915. In the *Kew Bulletin*, 1897, p. 416, it is erroneously stated that this post was held by Mr. G. R. Swayne. Between 1907 and 1913 he sent herbarium specimens to Kew. His name is commemorated in *Livistona Woodfordii* Ridl. in Gard. Chron. 1898, xxiii. 177. C.H.W.

BENJAMIN DAYDON JACKSON.—The death of Dr. Jackson was briefly recorded in the last number of the Bulletin. While passing across Buckingham Gate on October 1st, he was knocked down by a motor-car and was removed to Westminster Hospital. After some days he rallied to such an extent as to give hopes of a speedy recovery, but a relapse took place and he passed away on October 12th. The funeral service at Golder's Green Crematorium took place on October 17th in the presence of a large gathering of botanists and others.

Dr. Jackson was born in London on April 3rd, 1846, and after being educated at private schools entered upon a commercial career in the City, which, however, did not last long. In 1865, while staying in Sussex during recovery from an illness, his attention was directed to botany, to which (especially its bibliography) the greater part of his after life was devoted. In January, 1868, he was elected a Fellow of the Linnean Society, and in 1880 became its botanical Secretary, a post to which he was annually re-elected until 1902. During this period he took great pains in editing the Society's botanical publications and compiled an index to the first twenty volumes of the Society's Journal (Botany), and the botanical portion of its Proceedings up to June, 1886. Although up to 1902 Dr.

Jackson was working almost daily in the Kew Herbarium, he found time to make himself thoroughly acquainted with the Linnean collections at Burlington House, which culminated in his compiling an "Index to the Linnean Herbarium," which was published with the Proceedings of the Society for 1911-1912. In 1902 Dr. Jackson was appointed to the newly created salaried post of General Secretary to the Society and held it until May, 1926. His retirement after forty-six years' official connection with the Society was marked by the presentation of his portrait (which now hangs in the Society's Rooms) by Fellows and others, and by his appointment as Honorary Curator of the Linnean collections.

Perhaps the time of his life which gave him the greatest pleasure was when, in May, 1907, he visited Sweden as one of the delegates from the Linnean Society of London to take part in the celebrations in connection with the bicentenary of the birth of Linnaeus, which are described in the Proceedings for 1906-1907, pp. 59-60. On this occasion he was made by the King of Sweden a Knight of the Polar Star, by the University of Upsala an honorary Doctor of Philosophy and Master of Arts, and by the Swedish Linnean Society an honorary Fellow.

After his appointment as General Secretary, his visits to Kew were almost restricted to Saturday afternoons, when he arranged and indexed the vast mass of correspondence which had accumulated over many years and has now been bound and deposited in the Library. During the present year he has again visited Kew in connection with the preparation of a new edition of his "Glossary of Botanic Terms," the last occasion being on July 6th.

Even allowing for the fact that Dr. Jackson's life was a long one and that he appears to have been favoured by excellent health, a survey of the enormous amount of work that he accomplished must convince one that he worked very rapidly and methodically and could have allowed himself but little leisure. In his achievements as a maker of botanical bibliographies, biographies and indexes he has no equal. Had he done nothing more for botany than the very large share he took in the compilation of the "Index Kewensis," botanists would have ample cause to regard him as one of their greatest benefactors. But he produced in addition to this colossal work several books and a multitude of papers which involved many a long and tedious research such as could have been successfully prosecuted only by one possessing an intimate knowledge of botanical history and bibliography and well acquainted with foreign languages. In another place we may hope to have a complete list of his many contributions to botanical literature.

Dr. Jackson has himself placed on record the main facts concerning the history of the "Index Kewensis" in articles communicated to the *Journal of Botany*, 1887, pp. 66 and 150, the *Gardeners' Chronicle*, 1909, xlv. p. 406, and the *Journal of the Royal Horticultural Society*, 1924, xlix. pp. 224-229.

In the interval between 1895, when the publication of the "Index Kewensis" was completed, and 1902, when he was appointed General Secretary of the Linnean Society, Jackson undertook the preparation of a "Catalogue of the Library of the Royal Botanic Gardens, Kew," published in 1899. Previously he compiled a "List of Kew Publications," which appeared in the *Kew Bulletin*, 1897, pp. 1-84 and 238-240. The "List of Collectors whose Plants are in the Herbarium" (*K.B.* 1901, pp. 1-80) is also Jackson's work. The first edition of his "Glossary of Botanic Terms" was issued in 1900; a second appeared in 1905 and a third in 1916. A new edition was in preparation at the time of Dr. Jackson's fatal accident.

He acted as Secretary to the Departmental Committee on Botanical Work and Collections at the British Museum and at Kew, which was appointed in 1900 and issued its Report in 1901, and was referee for all of the 14 annual volumes of the botanical section of the "International Catalogue of Scientific Literature," published during the period 1902 to 1919.

Though deploring the loss of one who was remarkable in many ways and really distinguished in his own particular fields, we must realise how excellent it was that life for Benjamin Daydon Jackson was so prolonged, for his many days were spent in an untiring effort to be useful not only to those of his own time but also to those of generations to come.

Hooker's Icones Plantarum.---The Bentham Trustees have now issued the first part of volume ii of the Fifth Series or Vol. xxxii of the entire work. This contains twenty-five plates with their accompanying descriptions. They include three species of *Struthiola* (Thymelaeaceae) from South Africa and eight species of *Commiphora* (Burseraceae) from Arabia and British Somaliland. All these are new species, seven of which have been described by Mr. T. A. Sprague from material collected by Drake-Brockman in Somaliland and one from an Arabian specimen collected by Bent. There are two representatives of the family Acanthaceae from Trinidad, one of which is *Isothea alba*, the only species of the genus.

A new *Astragalus* from Gallipoli represents the Leguminosae. Five representatives of the Gramineae are figured, *Pleiadelphia* Stapf and *Lasiorrhachis* Stapf being new genera. The former comes from the Portuguese Congo and the latter is a native of Madagascar. Of the other grasses two come from Madagascar, *Viguiereella madagascariensis* A. Camus et Stapf, and *Lecomtella madagascariensis* A. Camus, and the fifth is *Leptosaccharum filiforme* A. Camus, a unique species from Brazil and Paraguay. A new species of Iridaceae, *Zygotritonia crocea* Stapf, from Northern Nigeria, is also figured and a description given of another new species, *Z. praecox*, from the same region.

Other plants figured include *Pseudoscolopia polyantha* Gilg, Flacourtiaceae, from South Africa, *Veronica rigida* Turrill, *Viola*

delphinantha Boiss. and *Epimedium pubigerum* Morren et Decaisne from Greek Macedonia and Bulgaria. A figure of *Boottia muricata* C. H. Wright, Hydrocharitaceae, from Ngamiland, South Africa, completes the series of plants illustrated in this part.

Principles of Soil Microbiology*. Professor Selman A. Waksman, whose joint book on Enzymes has been recently noticed (*K.B.* No. 3, 1927, p. 142), has produced a companion volume dealing with Soil Microbiology. Like the previous work, it is a compilation, and aims at bringing together all the scattered information on the subject. Professor Waksman's own work on the micro-organisms of the soil has placed him in a position well fitted to produce a compilation of critical value. He has, however, increased its value by submitting certain sections to specialists in the respective branches, whose helpful criticism is acknowledged in the preface.

The work is divided into four parts, namely:—

- A. Occurrence and Differentiation of Organisms in the soil—serving as a general introduction.
- B. Isolation, Identification, and Cultivation of soil micro-organisms. Under this head are discussed in turn bacteria and their activities (8 chapters), soil algae, soil actinomycetes, soil protozoa, and the non-protozoan fauna of the soil.
- C. Chemical Activities of Micro-organisms.
- D. Soil microbiological processes and Soil fertility.

The two latter sections occupy more than one half of the book, and aim at giving a connected view of the processes taking place in the soil, and their relation to plant growth. A concluding chapter summarises the history of the science, and indicates directions in which further investigation is required.

The usefulness of the work is enhanced by the addition of a list of books of reference, copious bibliographical foot-notes, and a fairly full index.

The ground covered by Prof. Waksman is somewhat similar to that included in the joint Rothamsted Monograph "The Micro-organisms of the Soil," but gives much greater detail. For the general reader who is not specially interested in soil science, but merely wants to keep abreast of recent agricultural developments, the Rothamsted volumes are still the most readable source of information. The present volume, in the words of the preface, is to be "looked upon more as an introduction to further research rather than as an ordinary text-book, as of help to those working in the allied sciences, who are desirous of obtaining some information concerning the soil population and its activities." Its price is unfortunately high, but there is no doubt that it will be widely used, both by the specialist and the general worker in sciences connected with agriculture.

E.M.W.

*Principles of Soil Microbiology, by Selman A. Waksman. Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden, London, W.C. 2, 1927; pp. xxviii and 897, 19 plates, 77 figures in text, price 45s.

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